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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,203	12/31/2003	Bin Li	I-2-0482.1US	9186

24374 7590 04/20/2007

VOLPE AND KOENIG, P.C.  
DEPT. ICC  
UNITED PLAZA, SUITE 1600  
30 SOUTH 17TH STREET  
PHILADELPHIA, PA 19103

EXAMINER

AHN, SAM K

ART UNIT

PAPER NUMBER

2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/20/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/750,203

Applicant(s)

LI ET AL.

Examiner

Sam K. Ahn

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-14 is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments, see p.15, filed 01/16/07, with respect to the rejection(s) of claim(s) 1-14 under 101 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Malm et al. US 7,154,966 B2 (Malm) in view of McCarty, Jr. et al. US 6,704,353 B1 (McCarty).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malm et al. US 7,154,966 B2 (Malm) in view of McCarty, Jr. et al. US 6,704,353 B1 (McCarty).

Regarding claim 1, Malm teaches a method for demodulation of M-ary quadrature amplitude modulation (M-QAM) signals by estimating the amplitude of a received M-QAM signal based upon phase information from a plurality of transmitted symbols ( $d_k$ ), the method comprising the steps of: recovering a respective set of received symbols ( $r_k$ ) corresponding to the plurality of transmitted symbols ( $d_k$ ) (see expression (1) in column 6); generating a set of

products (the expression (1) of  $dk$  is products of variables); summing the set of products ( $dk$  sums the products in expression 3); determining the real part of the sum of products (see expression 4a of  $\text{Re } dk$ ).

Although, Malm further teaches summing the absolute values of the transmitted symbols (absolute value of  $\text{Re } dk$  in expression 4a), and generating the estimated amplitude of the received M-QAM signal by dividing the real part of the sum of products by  $N$  to generate an estimated amplitude for the M QAM signal (see expression 4b), does not explicitly teach summing the absolute values of the transmitted symbols to generate a magnitude value; and generating the estimated amplitude of the received M-QAM signal by dividing the real part of the sum of products by the magnitude value to generate an estimated amplitude for the M QAM signal.

McCarty teaches summing the absolute values of the transmitted symbols to generate a magnitude value (note c.4, l.57); and generating the average of the transmitted symbols by determining the magnitude values.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of McCarty in the system of Malm by dividing the expression 4b of Malm by the magnitude values of McCarty for the purpose of determining the amplitude of the values within a window of a symbol, note c.4, l.52-65 of McCarty.

Regarding claim 2, Malm in view of McCarty teaches all subject matter claimed, as applied to claim 1, and although does not further teach wherein said generating step comprises: multiplying each of the plurality of received symbols  $(r_k)$  by  $\exp[-j0(d_k)]$ , wherein  $0(d_k)$  represents the phase of a corresponding transmitted transmitting symbol  $(d_k)$ , at the time of the invention, it would have been obvious to a person of ordinary skill in the art to implement as such. Applicant has not disclosed that such implementation provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with expression 4b because it considers the phase of the signal by taking the imaginary part of the signal "Im". Furthermore, the expression of  $r_k$  by  $\exp[-j0(d_k)]$  is a well-known polar form. Therefore, it would have been obvious to one of ordinary skill in this art to modify the teaching of Malm by implementing the imaginary part of the signal with polar form of  $\exp[-j0(d_k)]$  to obtain the invention as specified in the claim.

### ***Allowable Subject Matter***

#### **3. Claims 3-14 are allowed.**

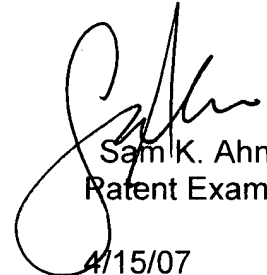
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information

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for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sam K. Ahn  
Patent Examiner  
4/15/07